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**MODLER for Windows**

Economic Information and Modeling System

# MODLER User Guide

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Philadelphia and Cambridge

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# An Overview

The software described in this User Guide is the result of over 40 years development and use. During this time, MODLER has acquired characteristics that permit it to be used in a variety of ways that might at first appear to be quite disparate but actually reflect how it has been employed both as a general applied economic analysis tool and to create more than 2000 documented, often large-scale models of two types in particular: macroeconometric simultaneous equation models and theoretical macroeconomic models. Such uses each require the management and display of economic data, in substantial quantities in some cases. Once observations have been stored in the integrated database, they can be displayed both graphically and in the context of tables of various types, as well as manipulated in a variety of ways. Notably, MODLER can be used in seamless conjunction with spreadsheet, word processing, and presentation display software, including Word, Excel, and PowerPoint, as well as Internet browsers, such as Firefox or Internet Explorer. It is also specifically designed to permit a user to document the research process essentially as a by-product of that research. Yet its most notable characteristics are those associated with the research needs of economists. Certain uses may involve the application of parameter estimation and other statistical and econometric techniques. Others may require the solution of linear or non-linear simultaneous models. The union of these capabilities allows MODLER to be used by econometricians and applied economists, on the one hand, and theoretical economists, on the other.

However, rather than to focus upon individual analytic characteristics and capabilities, it might be more useful initially to adopt a wider perspective. One way to characterize MODLER generally is as a resource manager. In particular, it can be used to create and manage a variety of resources that includes time series data banks, economic and econometric models, plots and other graphics displays, tabular reports, and various other such objects. A time series *data bank*, in this context, can be defined as a collection of economic measurements that are conceptually related to each other and, in particular, are organized into time-dated observations on economic and other societal variables. Associated with each such data bank is a data dictionary, or *index*, this index possibly displaying simply a list of the time series variables the bank contains. Actually, this list can be displayed in any of several forms that range from a collection of only the variable names to that list of names together with a fairly complete description of their characteristics; the latter in its most complete form being called a *fully documented* (or FullDoc) *index*. Furthermore, such listings can consist of all the series in a bank, or else a given subset, although when a particular subset consists of an arbitrary selection of time series, it is called a *group*. *Index* therefore denotes an ordered collection of economic variable names (including, possibly, a description of characteristics), often arranged alphabetically. In turn, the names themselves usually each have a mnemonic quality, so that when they appear in the context of equations, logical expressions, commands, and other such contexts, the analyst will be able to recognize immediately its specific research meaning.

A central MODLER design concept is that it is natural for an economist to work with data collections the elements of which have an obvious mutual conceptual relationship; for instance, the National Income and Product Accounts or Flow of Funds data for some particular economy, or price or employment data for some industry or collection of industries. These are inherently logical as collections of economic statistics,

both as regards the way in which the observations they contain tend to be made publicly available by government statistical agencies and others, and the way in which they are used during the research process.

However, these collections are often also fuzzy sets conceptually. Furthermore, they are subject to change: elementally, they sometimes need to be combined or disassembled and reorganized and reassembled. Reflecting this potential management need, each data bank managed by MODLER can contain as many as 10,000 time series, and the program can open for access up to 15 banks at a time, which of course means that in principle operations can be performed that could involve simultaneous selection from as many as 150,000 collected series. Within this context, new data banks, even large banks, can be created easily, both implicitly and explicitly, with data series copied from one to another to form a new collection for some particular purpose, and each series' documentation simultaneously transferred in the process. Of course, seldom, if ever, has anyone used the program at this extreme scale of operation, but the point is that MODLER offers an unconstrained environment that is designed to allow you to access, manage, and maintain even large data sets, if you wish. It therefore incorporates various facilities that are designed to make this a feasible undertaking, whatever your particular scale of operation.

Of course, organized time series data sets are not the only collections of possible interest. In addition to permitting data banks to be formed as conceptually convenient collections of time series, MODLER also allows you to manage other types of objects that you may want to work with, among them tables that contain particular variables, which you can organize and classify, or plots of variable observations over time that also can be named, classified, and displayed repeatedly on a weekly, monthly, or annual basis, as new observations become available – or even collections of models that refer to particular economies or regions or industries. Notice that, conceptually, these objects each fundamentally consist of collections of observations on economic variables that are operated on in specific ways.

MODLER in addition incorporates various automatic data management facilities. For instance, whenever transformations or other such data operations are performed that instantly create new variables the program will automatically create a temporary workspace, in the absence of instructions to the contrary, known as a *Memory File*. This Memory File operates as a temporary, working data bank and is automatically accessed subsequently. At your option, the contents of this workspace can be saved from session to session and, once created, MODLER will remind you to consider saving it, before closing out that session.

MODLER performs these operations in a world in which the data are published and distributed in a variety of formats. Your work, in turn, will involve the creation of documents, presentations, tables, graphs, and other displays, many of which will inevitably involve the use of third party software packages; no single program can do everything and, in any case, you bring to the task your past experience of other software. Furthermore, today, the way in which you both acquire your raw materials and present your work can include both hard copy and machine readable forms, including the Internet, as well as (now nearly antiquated) diskettes, flash drives, CDROMs, and other forms. MODLER is therefore designed to import data in a variety of ways, export results conveniently, and interact with a variety of other software packages in the process, including word processors, spreadsheet packages, presentation managers, and Internet browsers.

These are all evolutionary developments, during the past 40 some years. Originally, starting in 1968, MODLER was created specifically in order to estimate a version of the Brookings Quarterly Econometric

Model of the United States. Reflecting the extension of this purpose, MODLER today supports the construction, maintenance, and use of econometric models that can range in size from a few equations to 1000 or more, depending upon the specific MODLER version. These models can be dynamic or static, recursive or simultaneous, and linear or non-linear. Virtually any type of structural economic or econometric model can be solved by MODLER, including those the behavior of which is defined by complex objective functions and multi-sector models that incorporate Input-Output structures and other unusual features. Its specific capabilities have been the subject of a series of books and articles written by its developers and users and selected examples can be found on the References page of the [www.modler.com](http://www.modler.com) website. In addition, the *Learning Tools* section of this website offers a workbook that demonstrates step-by-step the construction and use of a small well-known macroeconomic model, Klein Model I. It also offers a workbook that considers the construction and use of theoretically defined operative economic models, intended to be read as a companion volume to the book by Wynne Godley and Marc Lavoie, *Monetary Economics*, published in 2008 by Palgrave Macmillan. In turn, the misspecification tests offered by MODLER and other econometric software packages are the subject of a book recently published by Springer, *The Practice of Econometric Theory*. The Macmillan and Springer books are available from Amazon and other booksellers. Because these books and workbooks exist, the present *User Guide* aims to provide a step-by-step general introduction to MODLER's most widely-used data base maintenance and analysis features rather than its most sophisticated capabilities, which are considered only briefly.

The generation of MODLER described in this *User Guide* is designed to operate in the context of the most recent 32-bit versions of the Microsoft Windows operating system, namely Windows XP, Vista, and Windows 7, although earlier Windows versions can be used instead. The *MODLER Getting Started Guide*, also available from the *Learning Tools* section of [www.modler.com](http://www.modler.com), should be read before this *User Guide*, as it describes both the process of installing MODLER and its subsequent updating. This *Getting Started Guide* in addition addresses certain of the characteristics of the Vista and Windows 7 operating systems that can affect both the installation and use of MODLER. The particular way in which these operating systems may be configured on your computer can both prevent MODLER's successful installation and impede its operation once installed. MODLER is designed to operate with the Professional and Ultimate 32-bit versions of Microsoft Windows. The Home and netbooks versions cannot be used, nor can any 64-bit version of Windows. However, it is apparently possible to operate MODLER successfully using the Apple Mac OS X "Snow Leopard" and (prospectively) later operating systems, running on an Intel CPU, provided that a Microsoft Windows emulator is used, although such use is not actively supported by Alphametrix.